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MOURNING DOVE STATUS REPORT

1968

WEBER

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
Special Scientific Report — Wildlife No. 129

MOURNING DOVE STATUS REPORT, 1968

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ABSTRACT

The Density Index of breeding doves declined in each management unit between 1967 and 1968 at the following rate: Eastern, 4 percent; Central, 2 percent; Western, 13 percent; and the entire contiguous United States, 5 percent. The management unit indexes for 1968 were below the preceding 10-year mean as follows: Eastern, 8 percent; Central, 13 percent; Western, 22 percent, and contiguous 48 United States, 13 percent. Population indexes are at the lowest levels in recent years. Regression analyses suggest that the trend in populations has been downward in all units since 1958. Although biased to an unknown degree, data collected in conjunction with the Annual Waterfowl Mail Questionnaire Survey suggest that the harvest in the United States increased 28.9 percent and that dove hunters (who also purchased duck stamps) increased 31.5 percent during the period 1965-66 through 1967-68. The increase in harvest was due chiefly to an increase in hunter numbers.

INTRODUCTION

Management of mourning doves in the United States is confined essentially to the regulation of hunting to permit the maximum harvest compatible with wise use of the resource. The Call-Count Survey, conducted annually since 1953 by Federal, State, and independent observers on more than 800 prescribed routes, provides population data on which wildlife administrators rely heavily in setting annual hunting regulations. This report describes the methods employed to obtain and analyze such data and presents the status of the 1968 mourning dove breeding population.

Two versions of the report, one preliminary and one final, are prepared annually. In 1968, the preliminary version was mailed to members of the Dove Regulations Committee 1 week before the regulations meeting, held in June each year at Washington, D.C. This timely distribution was made possible by the promptness of cooperators who sent their data directly to the Migratory Bird Populations Station, Laurel, Md., immediately after completion of their surveys. This report is the final version and contains additional survey data received too late for use in the preliminary version. It is distributed to all cooperators and is available to other interested organizations and individuals.

Data gathering and analyzing procedures were basically similar to those used in 1967 (Ruos and MacDonald, 1968). A refinement in machine data processing resulted in a comparable, but not identical, procedure for computing management unit means.

PART I--MOURNING DOVE BREEDING POPULATION STATUS

PROCEDURE

The Call-Count Survey

Field studies have demonstrated the feasibility of the Call-Count Survey for detecting annual changes in mourning dove breeding populations (Foote and Peters, 1952). Since 1953, these surveys have been conducted throughout the United States over a system of more than 800 established routes. Each call-count route has twenty 3-minute listening stations spaced at 1-mile intervals, usually on lightly traveled secondary roads.

Each route is checked once between May 20 and June 10. Intensive studies in the eastern United States (Foote and Peters, 1952) indicated that dove calling is relatively stable during this period. Call-count surveys are not made when wind velocities exceed 12 miles per hour or when it is raining.

Records are kept of all doves seen or heard calling along the routes. The numbers heard calling during the 3-minute listening periods are totaled for each route to provide the data for determining the population index. The numbers of calls per dove and of doves seen are not currently used in the index calculation, although they are recorded. A detailed analysis of these and other pertinent data from past call counts is currently under study by the Migratory Bird Populations Station.

The Call-Count Survey has limitations and possible biases which require further study. One shortcoming is that the Survey does not measure the current year's production. This may be especially significant since most of the fall population is normally composed of young-of-the-year.

Studies by Frankel and Baskett (1961) and Jackson and Baskett (1964) showed that unmated males call at a greater rate than mated males. This suggests that the reliability of the annual call-count census is reduced by the variability in the ratios of mated to unmated males. However, Wight (1964) observed that variations in the ratio of mated to unmated males, where the adult sex ratio approached equality, did not significantly alter the reliability of the dove call count for measuring annual trends of breeding mourning doves. Irby (1964) also found no evidence on his Arizona study area the the number of unmated males materially affected call-count results.

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Quality checks of field data

Survey reports were examined to determine circumstances affecting the accuracy with which the routes were run and the data recorded. Records for routes run under unacceptable conditions were deleted from analysis. Reports on routes completed under the prescribed conditions but containing discrepancies, errors, or missing data were examined to ascertain whether parts were acceptable. If so, they were used in analyses for which they were applicable. If observers changed on a route from one year to the next, the data were examined to determine whether an unexpected population change was apparent. Such differences, when detected, were attributed to observer differences, and the data were deleted.

Randomization of call-count routes

The original call-count routes (established between 1951 and 1956, and hereafter designated "management routes") were often selected in areas of high-density dove populations not representative of entire States or management units.

Randomly located routes were first employed in seven southeastern States in 1957 (Foote, Peters, and Finkner, 1958). A comparative study of random and management route data from these States confirmed earlier assumptions that a revision of the nationwide call-count survey routes should be undertaken if representative dove population indexes were to be obtained. This recommendation prompted the gradual selection and establishment of the 868 randomly located call-count routes now employed in 44 States. Selection of random routes in the remaining four States, Maine, New Hampshire, Rhode Island, and Vermont (now represented by 12 management routes), will be made in 1969.

Both types of routes were run during the transition from management to random routes. This procedure permitted a direct comparison of data (Foote, Peters, and Finkner, 1958). Since 1967, randomized data have been obtained for 44 States for 2 or more years.

Physiographic stratification of call-count routes

Biologists recognize the limitation of sampling wildlife populations by political units. Census data collected and analyzed by ecological divisions represent better statistical design and could be expected to provide more precise information.

An ecological sampling design for the collection of dove popula-
tion data, using physiographic regions as the basis for stratification,
was suggested by Foote, Peters, and Finkner (1958). The 78 regions
designated in this report (fig. 1) are based essentially on a map
entitled "Physical Divisions of the United States" prepared by Fenneman
(1931). Division boundaries were modified in several instances after
examination of field data and more recent ecological studies.

The combined use of physiographic stratification and randomization
of call-count routes makes it possible to determine with 95 percent
confidence that a real change has occurred when an observed change of
20 percent occurs within a management unit (fig. 2). Additional physio-
graphic and ecological studies, combined with an examination of regional
dove data, are expected to improve the statistical precision of this
analysis.

Breeding Density Index

The Breeding Density Index (BDI) is an indicator of the number of
doves per unit of area and is derived from the average number of calling
doves per route. To obtain as precise an average as possible for deri-
vation of this index, the call-count data are weighted according to
differences among land areas in each State and management unit.

Before 1966, the BDI for each State represented the average number
of birds heard calling per route within that State, thus weighting all
routes equally. The State averages were then weighted in proportion to
the estimated area of dove habitat in each State of a management unit,
to provide a Breeding Population Index for each unit (U.S. Bureau of
Sport Fisheries and Wildlife, 1957).

Beginning with the 1966 survey analysis, weighting factors based
on physiographic regions were used for calculating BDI values in States
which had been "randomized" for 2 or more years. The average number of
doves heard calling per route in each region within a State was weighted
by the percentage of the total land area in the State occupied by that
region.

Calculation of management unit BDI's since 1965 involved two simi-
lar procedures. In 1966 and 1967, indexes were determined for each
management unit by weighting each State's BDI by the percentage of the

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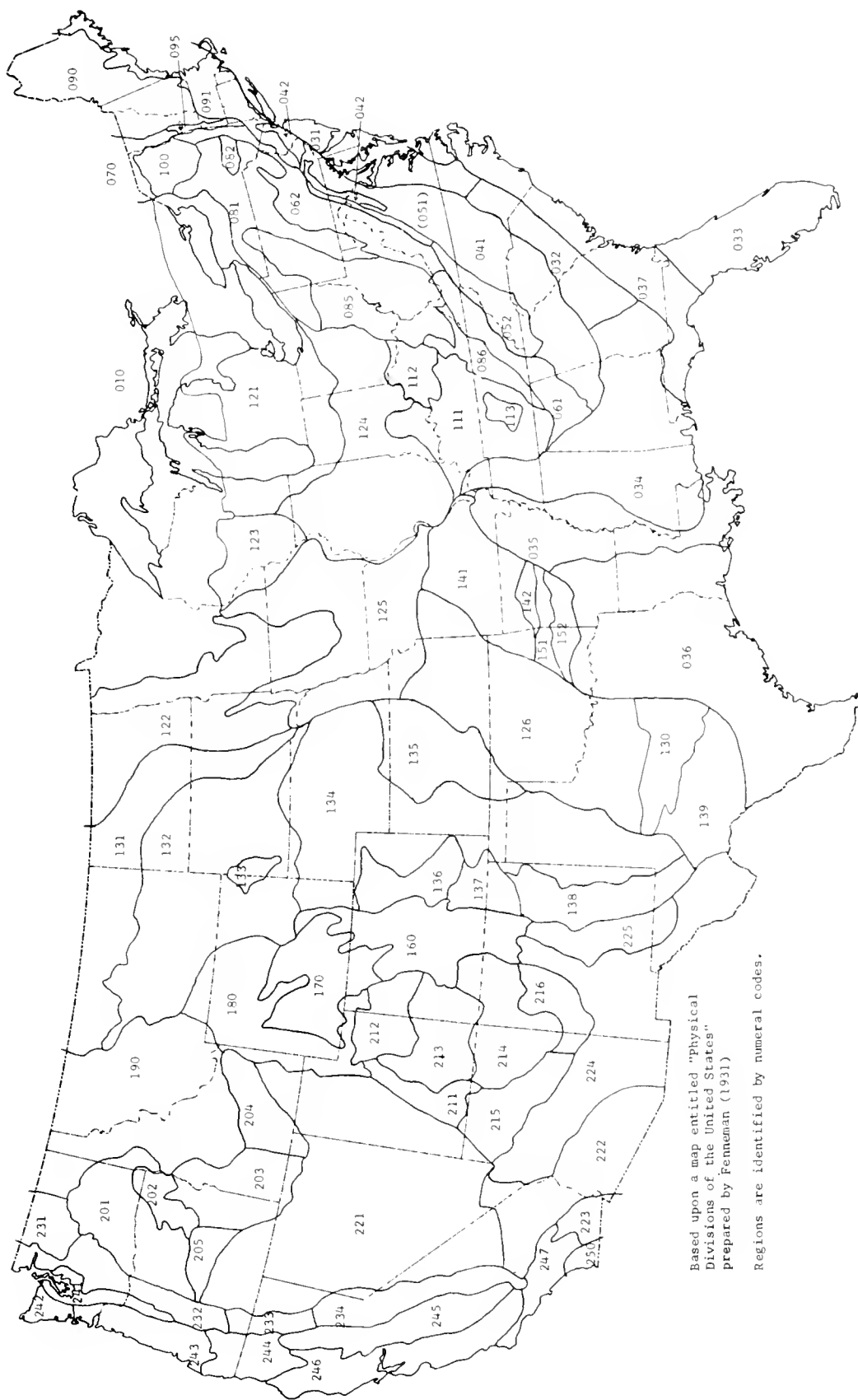Figure 1.--Physiographic regions used in analysis of mourning dove population data, 1968.
See page 6 for strata codes.

Based upon a map entitled "Physical
Divisions of the United States"
prepared by Fenneman (1931)

Regions are identified by numeral codes.

Physiographic Regions Used in Analysis of Mourning Dove Population Data, 1968 [Modified after Fenneman (1931)]

Description	Stratum Code
Laurentian Upland Division	
Superior Upland Province	010
Atlantic Plain Division	
Coastal Plain Province	
Embayed section	031
Upper Coastal Plain	032
Floridian section	033
East Gulf Coastal Plain	034
Mississippi Alluvial Plain	035
West Gulf Coastal Plain	036
Lower Coastal Plain	037
Appalachian Highlands Division	
Piedmont Province	
Piedmont Uplands	041
Piedmont Lowlands	042
Blue Ridge Province	
Northern section	051
Southern section	052
Valley and Ridge Province	
Tennessee section	061
Middle and Hudson Valley section	062
St. Lawrence Valley Province	
Champlain and Northern section	070
Appalachian Plateaus Province	
Mohawk and Allegheny section	081
Catskill section	082
Kanawha section	085
Cumberland section	086
New England Province	
Northern New England section	090
Southern New England section	091
Taconic section	095
Adirondack Province	100

Description	Stratum Code
Interior Plains Division	
Interior Low Plateaus Province	
Highland Rim section	111
Lexington Plain	112
Nashville Basin	113
Central Lowland Province	
Eastern lake section	121
Western lake section	122
Wisconsin Driftless section	123
Till Plains	124
Dissected Till Plains	125
Osage Plains	126
Great Plains Province	
Central Texas section	130
Missouri Plateau, glaciated	131
Missouri Plateau, unglaciated	132
Black Hills	133
High Plains	134
Plains Border	135
Colorado Piedmont	136
Raton section	137
Pecos Valley	138
Edwards Plateau	139
Interior Highlands Division	
Ozark Plateaus Province	
Springfield-Salem plateaus	141
Boston "Mountains"	142
Ouachita Province	
Arkansas Valley	151
Ouachita Mountains	152
Rocky Mountain Division	
Southern Rocky Mountains Province	160
Wyoming Basin Province	170
Middle Rocky Mountains Province	180
Northern Rocky Mountains Province	190

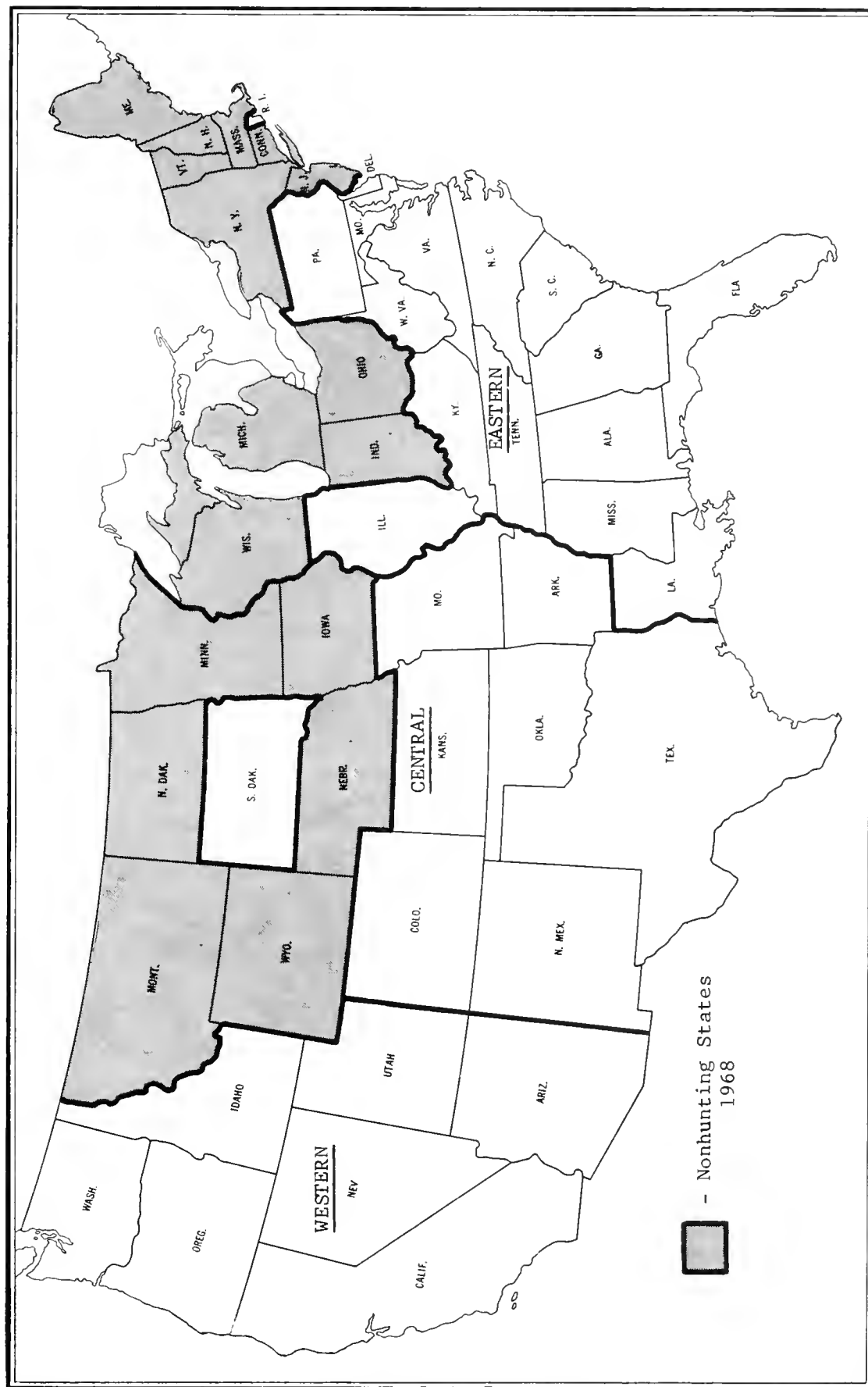| Description	Stratum Code
Intermontane Plateaus Division	
Columbia Plateaus Province	
Walla Walla Plateau	201
Blue Mountain section	202
Payette section	203
Snake River Plain	204
Harney section	205
Colorado Plateaus Province	
High Plateaus of Utah	211
Uinta Basin	212
Canyon Lands	213
Navajo section	214
Grand Canyon section	215
Datil section	216
Basin and Range Province	
Great Basin	221
Sonoran Desert	222
Salton Trough	223
Mexican Highland	224
Sacramento section	225
Pacific Mountain Division	
Cascade Sierra Mountains Province	
Northern Cascade Mountains	231
Middle Cascade Mountains	232
Southern Cascade Mountains	233
Sierra Nevada	234
Pacific Border Province	
Puget Trough	241
Olympic Mountains	242
Oregon Coast Range	243
Klamath Mountains	244
California Trough	245
California Coast Ranges	246
Los Angeles Ranges	247
Lower Californian Province	250

Figure 2.—Mourning dove management units

- Nonhunting States 1968

total land area occupied by that State in the management unit. In 1968, management unit BDI's were derived using physiographic regions within States rather than States as the definitive sampling unit. Differences between these procedures are evident only when physiographic regions within States are not represented by comparable routes. Analysis by either procedure is considered equally valid.

Only four States (Maine, New Hampshire, Rhode Island, and Vermont) did not provide randomized data in both 1967 and 1968. Management route data from these States were not weighted and were not included in the management unit averages. Thus, comparable data for 1967 and 1968 BDI values are given for only 44 States.

Determination of short-term population changes, 1967-1968

Changes in the size of mourning dove breeding populations between 1967 and 1968 are indicated by data from 619 comparable routes run in both years. The average, appropriately weighted BDI values for each year are presented for each State and management unit (appendix table A1). Differences in these BDI values, expressed as percent change, determined the magnitude of changes in the breeding population index.

Determination of long-term population trends, 1958-1968

Short-term (year-to-year) population changes are based, as previously indicated, upon data from comparable routes only. Since the composition of these comparable routes changes with each 2-year comparison, it is not possible to use the uncorrected data to demonstrate long-term trends. For this purpose a Base Year Index (BYI) has been chosen for each State, and long-term trends have been shown by applying the percent change from year to year to this index. Before 1967, the BYI was generally the first year that the State's call-count routes were randomized. This method of selection had an advantage over the selection of a single year for all States.

In order to provide a more uniform basis for evaluation of long-term trends, the BYI for all States has been selected as the mean of the comparable 1966 and 1967 routes, as presented in the 1967 Mourning Dove Status Report (Ruos and MacDonald, 1968). This BYI is thought to provide a meaningful refinement of the previous method. Not only are two "random-route" years averaged to reduce the influence of a possible atypical year, but the choice of a uniform BYI period for all States reduces possible bias in overweighting a State by the selection of a BYI which represents an abnormally high population level.

As in the past, the BYI value for each State for each year is weighted to provide management unit values. This weighting is based on differences in land area among States. The land area values and the BDI values for States and management units by year are presented in appendix table A2.

Computer analysis of dove call-count data

Through the efforts of the North Carolina Institute of Statistics, University of North Carolina, and with the support of the Southeastern Association of Game and Fish Commissioners, an improved computer program was made available for the analysis of the 1968 call-count data. This program weights the State and management unit averages by physiographic region. It provides the mean difference, the standard error of the mean difference, and the level of significance of the change for each State and management unit. This program also provides a summary of data by physiographic region irrespective of State boundaries, thus allowing analysis of population distribution by physiographic region.

FINDINGS

Status of the 1968 mourning dove breeding population

The adjusted average numbers of mourning doves heard calling on comparable call-count routes in 1967 and 1968 are tabulated by State and management unit (appendix table A1). These figures, adjusted to a base-year, appear in appendix table A2.

United States.--The mourning dove Breeding Density Index decreased 4.7 percent from 1967 to 1968. The adjusted mean number of doves heard calling per route in 1968 was 13.5 percent below the 10-year average for 1958-67.

The average adjusted BDI for the dove-hunting States decreased 4.2 percent from 1967 to 1968, while the BDI for all nonhunting States decreased 5.8 percent. The BDI for all hunting States was 12.0 percent below the 10-year mean, and that for nonhunting States was 16.8 percent below this average.

Changes greater than 10 percent in the BDI between 1967 and 1968 are shown by physiographic region in figure 3. Major areas of population increase include the eastern Appalachian Highlands, southern Great Plains, and northern Columbia Plateau. Areas of decrease occurred in the western Appalachian Highlands, central Atlantic Plain, and in the northern sections of the Great Plains and Rocky Mountains.

Change in mean doves heard calling
per route between 1967 and 1968

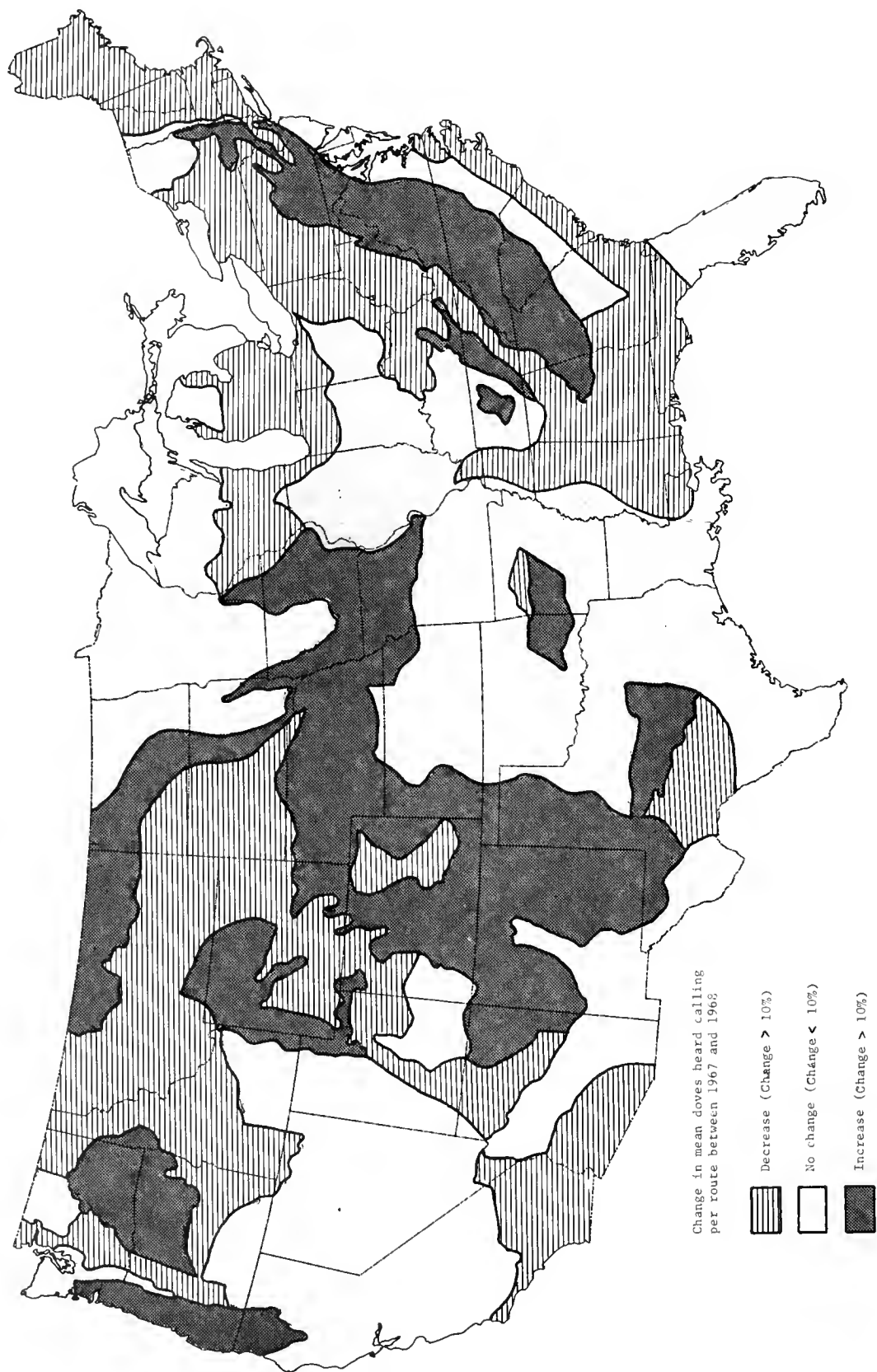|	
‖‖‖	Decrease (Change > 10%)
☐	No change (Change < 10%)
■	Increase (Change > 10%)

Figure 3.--Changes in densities of breeding mourning doves by physiographic region between 1967 and 1968.

Eastern Management Unit.--The 1968 Eastern Unit BDI was 27 percent below that of the Central Unit, but 37 percent above the Western Unit index. Between 1967 and 1968, the Eastern Unit BDI decreased 4.3 percent to a value 7.7 percent below the 1958-67 10-year mean.

The combined hunting States' (66 percent of the Unit land area) density index declined 4.6 percent between 1967 and 1968, while the combined nonhunting States' index declined 3.6 percent. The 1968 BDI for the hunting States was 12.3 percent below the 10-year mean, while the index for the nonhunting States was 6.1 percent above this mean. Examination of the nationwide data shows only one subunit, the nonhunting States of the Eastern Unit, with the 1968 index above the 10-year mean.

Central Management Unit.--The Central Unit had the highest BDI for 1968, 37 percent above the Eastern Unit and 87 percent above the Western Unit indexes. The BDI decreased 2.2 percent between 1967 and 1968, to a level 13.4 percent below the 1958-67 10-year mean.

For the combined hunting States (56 percent of the Unit land area)[1] the BDI increased 1.6 percent between 1967 and 1968: the only increase observed for any unit or subunit in the Nation for this period. The combined nonhunting States' index[1] declined 6.4 percent from 1967 to 1968. The 1968 BDI of the hunting States was 5.8 percent below the 10-year mean, while the index for the nonhunting States was 22.5 percent below this mean. A nationwide comparison of all hunting and nonhunting subunits reveals that the 1968 index for the nonhunting States in the Central Unit is the lowest in relation to its 10-year mean.

Western Management Unit.--In 1968, the Western Unit had the lowest BDI of any unit, 27 percent below the Eastern Unit and 46 percent below the Central Unit. All States within this Unit provide dove hunting opportunities. The BDI declined 13.4 percent between 1967 and 1968 (the greatest population decline of any unit), to a level 21.5 percent below the 1958-67 10-year mean.

1/ South Dakota data were included in the nonhunting States subunit. Hunting was permitted for the first time in recent years in 1967, but a change in subunit designation will not be made until 1970.

Statistical significance of data, 1967-68

The procedures employed on the annual call-count survey were designed to detect a statistically significant (p .95) change if the population index changed 20 percent between 2 consecutive years within a management unit (Foote, Peters, and Finkner, 1958). This means that, should a 20 percent change be observed, the chances are only 5 in 100 that no change actually occurred.

The decline in the Western Management Unit between 1967 and 1968 was statistically significant (p .95). Analyses of all other unit and subunit data failed to indicate statistically significant changes. Although the survey is not designed to detect population changes for States, statistically significant (p .95) decreases occurred in Massachusetts, Michigan, Wyoming, and Utah. Only in one State, Nebraska, did the index increase significantly (p .95) between 1967 and 1968 (appendix table A1).

A study of statistically significant (p .95) changes in the call-count indexes between 1967 and 1968 were made by physiographic region as shown in figure 1. Significant increases were noted over a large area of the Great Plains (regions 131, 134, 138), and in the Nashville Basin (113) of Tennessee. Significant decreases occurred over much of the western Colorado Plateau and adjacent Rocky Mountains (170, 211, 212, 215), and in southern New England (091).

Long-term dove population fluctuations, 1958-68

Statistically significant declines in the BYI occurred between 1958 and 1968 in all of the management units and subunits except the nonhunting States of the Eastern Unit. Linear regression lines are plotted in figure 4, and more complete information on the regression analysis and the results of tests for statistical significance are presented in appendix table A3. The greatest rate of decline during this period occurred in the Central Unit (-2.7 percent per year), followed by the Western (-2.1 percent per year) and Eastern Unit (-1.0 percent per year). Regression analyses indidated that population levels were declining, but seldom did these declines show statistical significance between 2 successive years.

Trends for each of the management units were also evident from comparison of annual BYI values to the respective 1958-67 10-year mean (fig. 5). In all management units, the 1968 indexes were at their lowest values for the designated 11-year period. Although there have been occasional increases in year-to-year comparisons, the general trend was downward, as shown by the regression analyses.
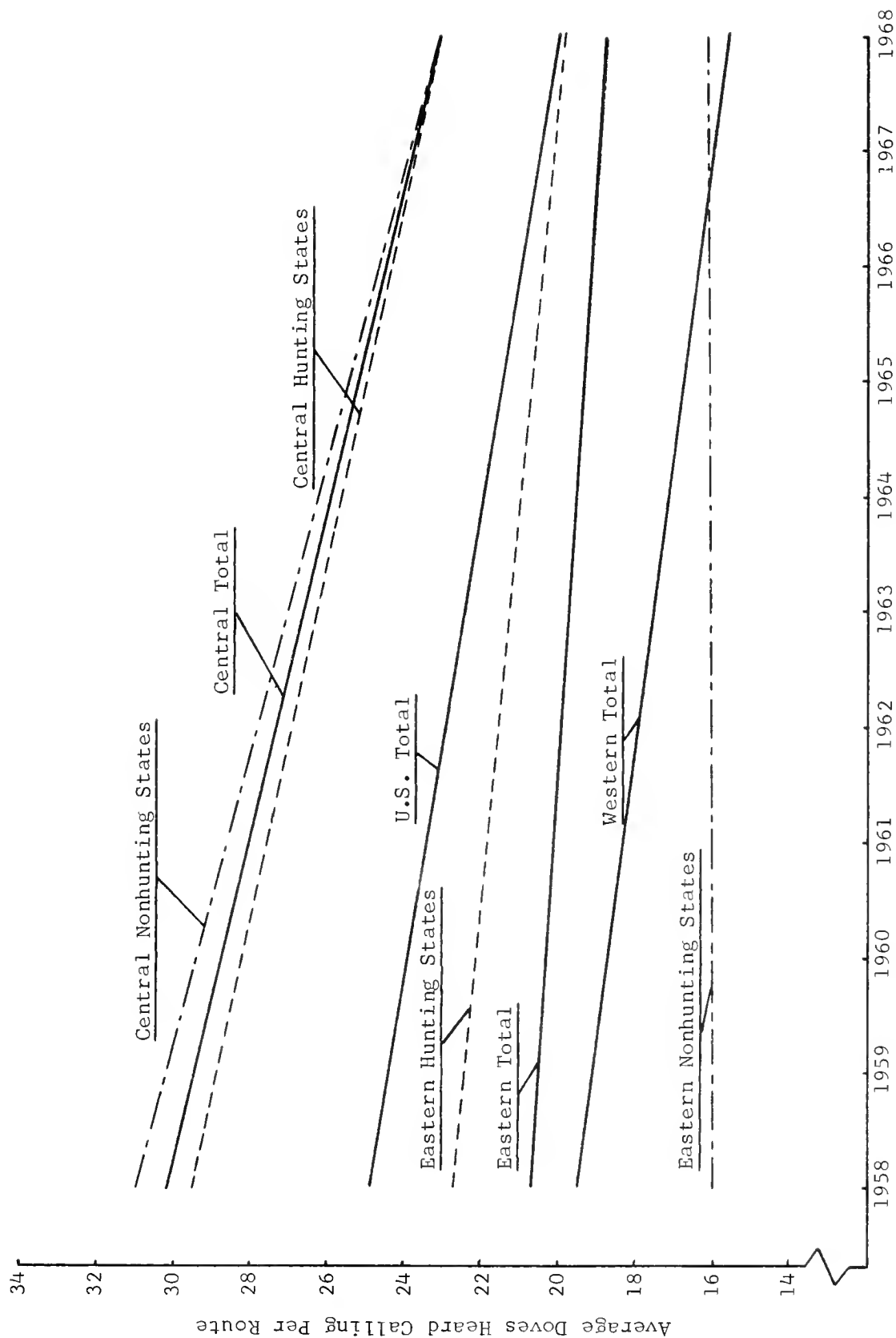
Figure 4.—Linear regression lines of mourning dove call-count data, 1958-1968

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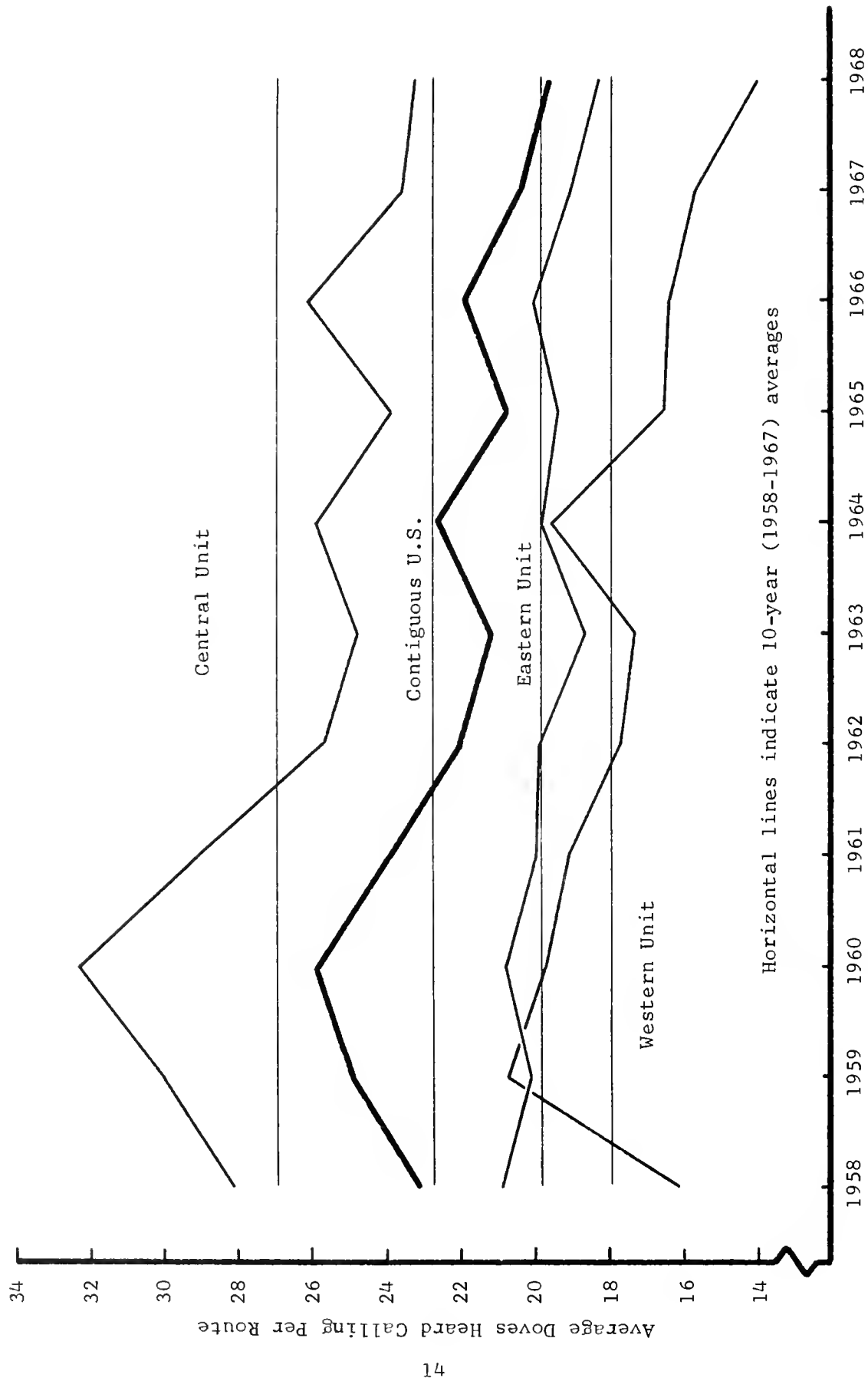
Figure 5.--Index of relative densities of breeding mourning dove populations by management units, 1958-1968, based upon call-counts

Horizontal lines indicate 10-year (1958-1967) averages

Trends in subunit breeding populations are shown in figure 6. The BYI's for 1968 in Central Unit nonhunting States and Eastern Unit hunting States were at the lowest levels for the period. Only in the Eastern nonhunting States was the 1968 BYI above the 1958-67 10-year mean. Comparison of population trends between all hunting and nonhunting States is shown in figure 7. The similarity of these trends cannot be broadly interpreted to mean that hunting does not influence breeding population levels, since the nonhunting States' dove breeding population contributes importantly to the overall hunting States' dove kill. Likewise, the lower dove density found in the hunting States cannot be broadly interpreted to mean that hunting depresses population levels.

In the 1966 Mourning Dove Status Report, Ruos and Tomlinson (1968) suggested that populations in the three management units fluctuated in unison more often than could be explained by chance. Data for 1967 and 1968 add strength to this suggestion. Since 1960 the three management units have fluctuated in synchrony except in 1965-66, when the Western Unit index decreased 0.1 bird while the other two units increased (fig. 5). The probability that synchronization was due to chance is less than 0.0004 or 4 times in 10,000 occurrences.

The BYI's for hunting and nonhunting States in the Eastern and Central Units were examined for extent of synchronization. The data show significant differences from expected values within management units. Since 1960, year-to-year population trends in hunting and nonhunting States of the Eastern Unit have agreed only once in eight comparisons. In strong contrast, a similar study of the Central Unit showed seven agreements during the same period. The probability that either was due to chance alone would be 0.07. No adequate explanation of the phenomenon in the Eastern Unit is apparent, although the direction of year-to-year changes in hunting State indexes between 1958 and 1968 tend to precede by 1 year the direction of change in the nonhunting States (p .83).

Annual changes in BYI's for the combined hunting and nonhunting States in the United States fluctuated in synchrony during seven of the eight occurrences between 1960 and 1968. The probability of this condition occurring by chance is 0.07.
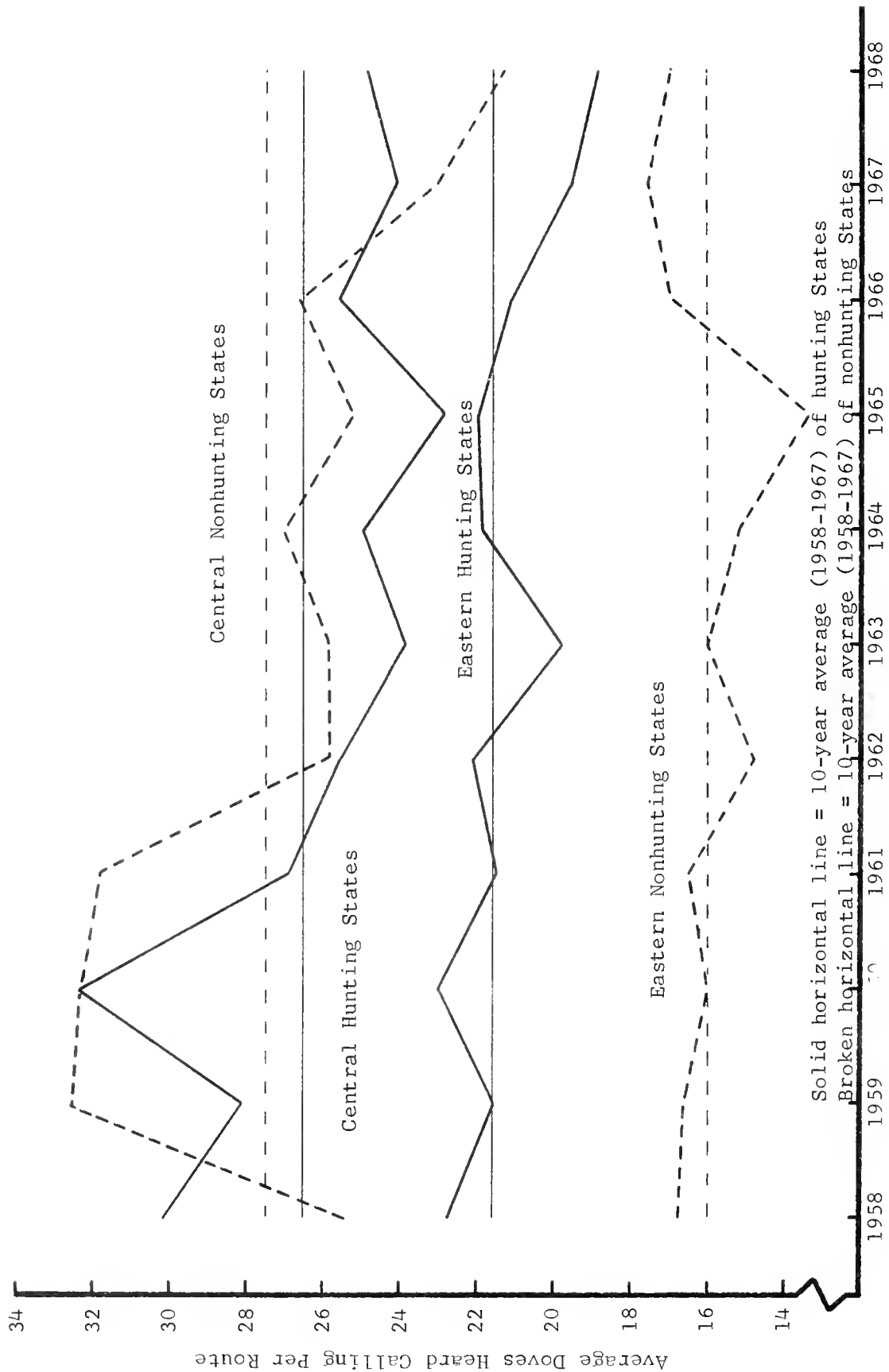
Figure 6.--Index of relative densities of breeding mourning dove populations based upon call-counts, Eastern and Central Management Unit hunting and nonhunting States,1958-1968
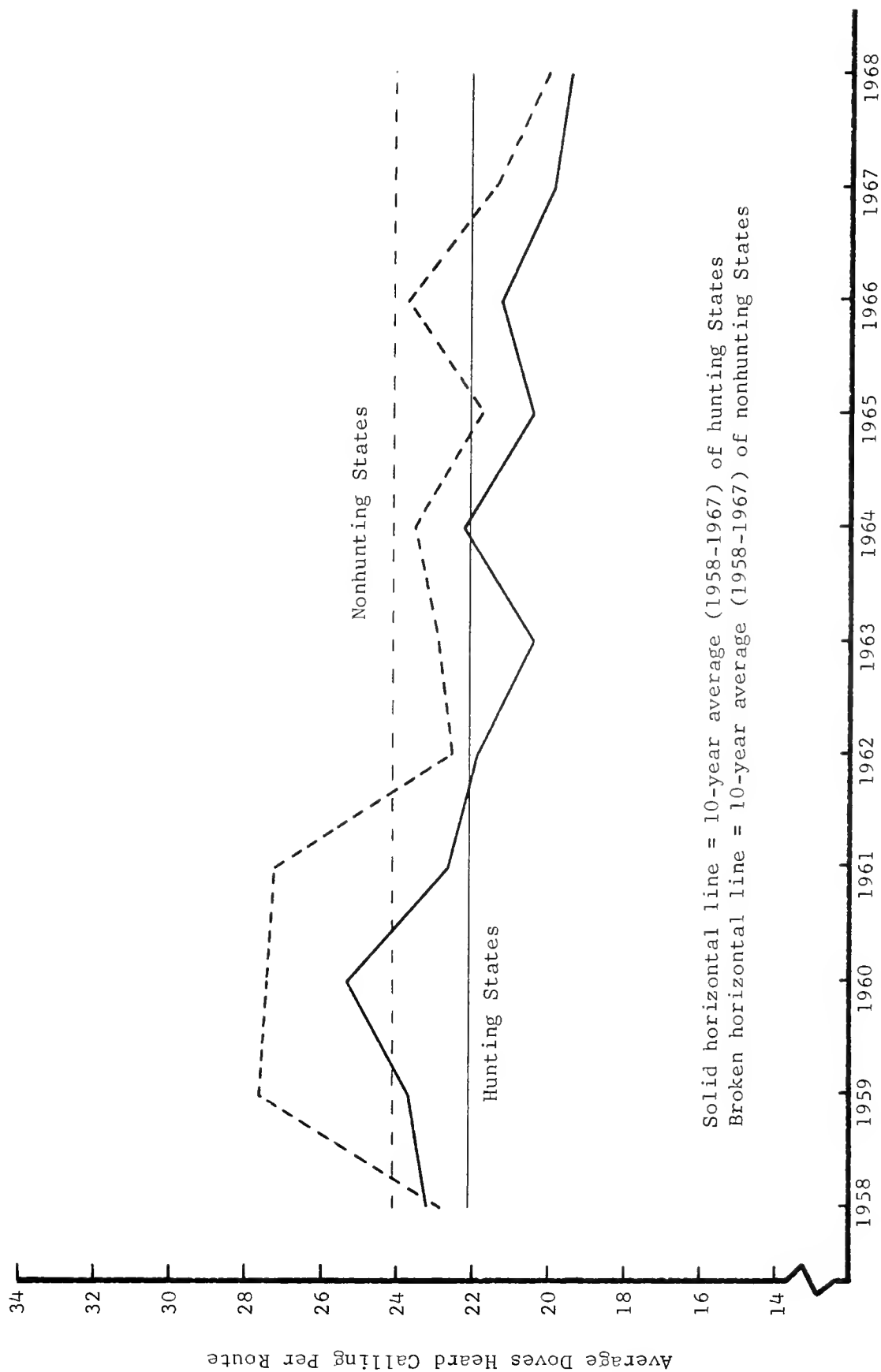
Figure 7.--Index of relative densities of breeding mourning dove populations based upon call-counts, hunting States and nonhunting States, 1958-1968

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Relative densities of breeding mourning dove populations by physiographic region are presented in figure 8. Further study was made to identify the major dove production areas by physiographic region within each of the management units. The BDI multiplied by the land area value it represents provides a Breeding Population Index (BPI). A physiographic region's BPI divided by the management unit's BPI estimates the relative size or importance of that region's population as compared with the unit's population. The relative importance of each of the 15 regions with the highest BDI values has been ranked by management unit in appendix table A4. Those physiographic regions representing about 50 percent of a management unit's population as ranked on BDI values are illustrated in figures 9 and 10. Four States (Maine, New Hampshire, Rhode Island, and Vermont) have been excluded from this analysis since no random route data were available.

United States.--The high-density areas shown in figure 9 represent 24.5 percent of the total U.S. land area and contain 49.8 percent of the Nation's dove breeding population. In these regions, the mean number of doves heard per route was 39.6, compared with 19.5 doves in the remainder of the unit. In 1968, greatest densities were found along the eastern border of the Great Plains from North Dakota to central Texas, and east through the Central Lowlands to Ohio. Other regions of high density occurred along the Upper Coastal Plain from central Georgia to North Carolina, and in the Sonoran Desert of California and Arizona.

Eastern Management Unit.--Excluding four New England States, 31.0 percent of the land area of this Unit contained 55.7 percent of the dove breeding population. The high density areas delineated in figure 10 contained an average of 31.8 doves per route, compared with only 11.4 doves in the remaining areas--the greatest percentage difference of all units. Highest densities were reported from the Upper Atlantic Coastal Plain (region 032) and Piedmont Lowlands (042) in the east, and from the Interior Plains (111, 124) in the west-central section.

Central Management Unit.--The Central Unit contains the highest dove densities in the Nation. In 1968, 53.9 percent of the Unit's population occurred on 29.2 percent of the area. This area is represented by an average of 44.5 doves heard per route, compared with 24.2 doves in the remaining section--the least percentage difference of all units. The high density area is generally confined to the Plains and Plains border

Mean doves heard calling per route, 1968

0.0 - 9.9	30.0 - 39.9
10.0 - 19.9	40.0+
20.0 - 29.9	
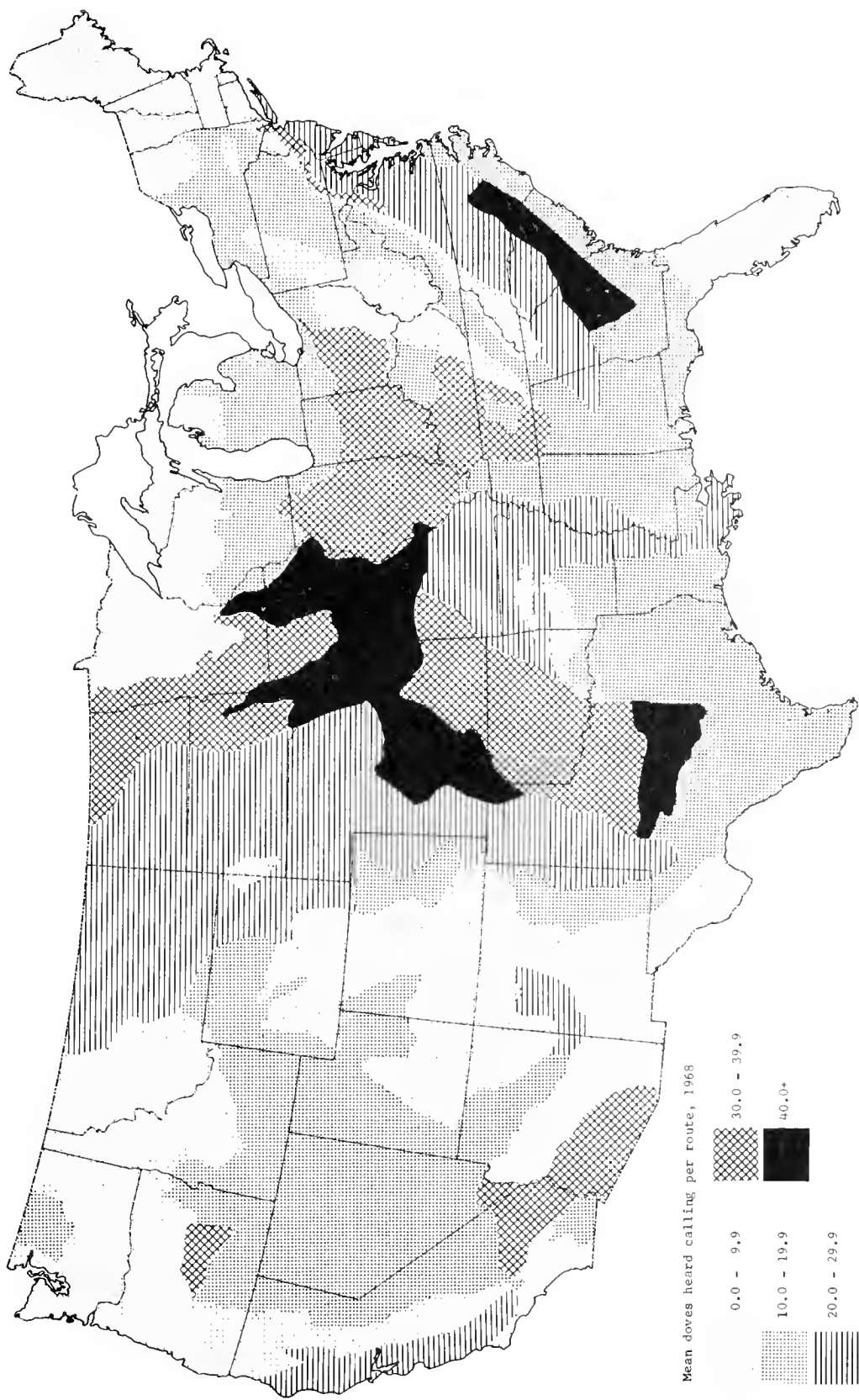
Figure 8.--Relative densities of breeding mourning dove populations by physiographic region, 1968.

Regions are identified by numeral codes.

- Major Population Areas
  50 percent of total population
  25 percent of total area
  Mean doves/route: 39.6

- Minor Population Areas
  50 percent of total population
  75 percent of total area
  Mean doves/route: 13.0
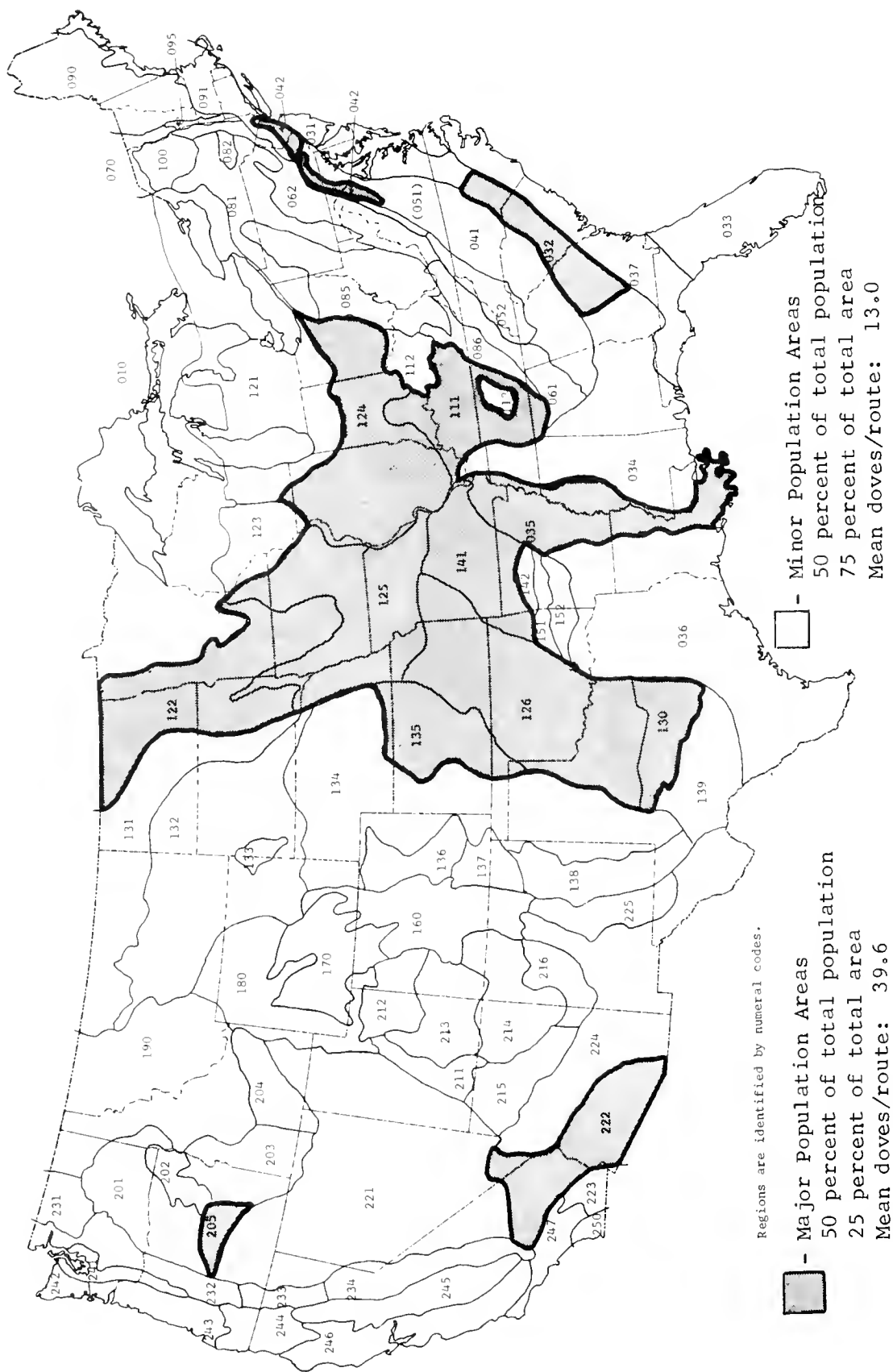
Figure 9.--Major dove breeding populations in the United States by physiographic region, 1968

Figure 10.--Major dove breeding populations by management unit and physiographic region, 1968

WESTERN

☐ - Major Population Areas
    50 percent of unit population
    30 percent of unit area
    Mean doves/route: 21.7

☐ - Minor Population Areas
    50 percent of unit population
    70 percent of unit area
    Mean doves/route: 9.2

CENTRAL

☐ - Major Population Areas
    54 percent of unit population
    29 percent of unit area
    Mean doves/route: 44.5

☐ - Minor Population Areas
    46 percent of unit population
    71 percent of unit area
    Mean doves/route: 24.2

EASTERN

☐ - Major Population Areas
    56 percent of unit population
    31 percent of unit area
    Mean doves/route: 31.8

☐ - Minor Population Areas
    44 percent of unit population
    69 percent of unit area
    Mean doves/route: 11.4

Regions are identified by numeral codes.

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(regions 135, 130, 125, 126, and 122) in the eastern portion of the Unit. The Plains border physiographic region (135) has consistently led the Nation in the greatest number of doves heard per route.

Western Management Unit.--The Western Unit's high-density areas represent 29.9 percent of the land area and contain 50.3 percent of the total population. In 1968, an average of 21.7 doves per route were heard in these areas, compared with 9.2 for the remainder of the Unit. Highest densities occurred in the southern Columbia Plateau (regions 203, 204, and 205), Sonoran Desert (222), and coastal California (246).

These data reveal that 10 percent of the land area supports 25 percent of the dove breeding population, and 30 percent of the area supports 50 percent of the population. A similar distribution exists in all units. The Central Unit contains the most homogeneous distribution and the highest density of doves in the Nation. Populations in the Eastern and Western Units are characterized by a more heterogeneous distribution, and densities are lower.

PART III--HARVEST OF MOURNING DOVES

The only nationwide survey which provides mourning dove harvest data is the annual waterfowl hunter survey. Included on the questionnaire, which is sent to a selected sample of "duck stamp"[1] purchasers, are questions pertaining to the hunting and harvest of other migratory birds, including doves.

In the Mourning Dove Status Report, 1966, (Ruos and Tomlinson, 1968) an attempt was made to synthesize all available information pertaining to mourning dove hunting and harvest. The resulting estimates of dove hunters and dove harvests for States, management units, and the entire United States are the most accurate yet provided. However, the information available for this study was admittedly inadequate for computing accurate harvest estimates and served to emphasize the need for a nationwide sampling frame of dove hunters.

Information obtained from the Waterfowl Hunter Questionnaire Survey as presented here is used to reflect trends in numbers of dove hunters, dove harvest, and dove hunter success. The survey does not provide data for estimating the numbers of dove hunters or the magnitude of the dove harvest. Dove hunter and harvest data obtained from the waterfowl survey are influenced by several recognized biases. The most obvious is the fact that only dove hunters who purchase a duck stamp are included in the sample. Not only is the portion of the dove hunters who do not purchase a stamp unknown, but it is certain that the hunters sampled perform differently from those not sampled. Furthermore, the portion of dove hunters who buy duck stamps varies from State to State. The only major influence which would tend to distort the year-to-year changes in harvest information obtained from this source would be a significant change in waterfowl hunting regulations resulting in a change in the proportion of dove hunters who purchase duck stamps.

Assuming that there has been no significant change in duck stamp sales to dove hunters over the past 3 years, we present the data from the questionnaire survey of the 1965-66, 1966-67, and 1967-68 hunting seasons as an index to the trends in harvest, number of hunters, and hunter success

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1/ Federal migratory bird hunting stamp (not required for hunting doves)

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(average season bag) over this period. It must be emphasized that these data represent the hunting effort only of those dove hunters who purchased a duck stamp.

Following are presented the data for the projected harvest of doves by adult waterfowl hunters (duck stamp purchasers) for the hunting seasons of 1965-66, 1966-67, and 1967-68, by management unit. Note that there is a considerable harvest of doves indicated for the nonhunting States. Questionnaire projections are based upon the location of the post office where the duck stamp was purchased rather than upon the residence of the individual in the sample. This situation probably accounts for most hunting reported from nonhunting States. In any event, the figures are probably a legitimate inclusion in management unit totals. The sharp increase in the Central Management Unit nonhunt figure for 1967-68 results from the change in the status of South Dakota from a nonhunting to a hunting State. It was included with the nonhunt States for continuity, even though a 5-day season was allowed in 1967-68.

Projected mourning dove harvest by adult waterfowl hunters

Area	1965-66	1966-67	1967-68
Eastern Mgmt. Unit	3,826,500	4,993,481	4,977,681
(Hunting States)	(3,774,600)	(4,933,375)	(4,953,655)
(Nonhunting States)	(51,900)	(60,106)	(24,026)
Central Mgmt. Unit	2,781,800	3,342,381	3,830,675
(Hunting States)	(2,756,800)	(3,284,992)	(3,647,660)
(Nonhunting States)	(25,000)	(57,389)	(183,015)[1/]
Western Mgmt. Unit	2,114,200	2,290,827	2,433,076
Total United States	8,722,500	10,626,689	11,241,432

1/ South Dakota became a dove-hunting State in 1967-68

These data clearly indicate an increasing trend in the harvest of mourning doves over the 3-year period, particularly in the Central and Western Management Units. Harvest in the Eastern Management Unit did not increase between the seasons of 1966-67 and 1967-68, but the increase between 1965-66 and 1966-67 was greater than in other units.

Below are presented the projected number of adult waterfowl hunters who hunted doves during these three hunting seasons.

Projected number of adult waterfowl hunters who hunted doves

Area	1965-66	1966-67	1967-68
Eastern Mgmt. Unit	137,860	169,164	180,326
(Hunting States)	(134,550)	(165,772)	(177,933)
(Nonhunting States)	(3,310)	(3,392)	(2,393)
Central Mgmt. Unit	97,810	119,845	146,801
(Hunting States)	(95,960)	(117,405)	(134,599)
(Nonhunting States)	(1,850)	(2,440)	(12,201)
Western Mgmt. Unit	104,040	114,886	119,865
Total United States	339,710	403,895	446,865

From these data, it can be seen that the increase in dove hunters (at least among duck stamp purchasers) is even more striking than the increase in harvest over the 3-year period.

Following are presented the percent change in both hunters and harvest between each of three hunting seasons.

Percent change in mourning dove hunters and harvest by adult
waterfowl hunters, 1965-66 through 1967-68

	1965-66 to 1966-67		1966-67 to 1967-68		1965-66 to 1967-68	
	Harvest	Hunters	Harvest	Hunters	Harvest	Hunters
Eastern Mgmt. Unit	+30.5%	+22.7%	- 0.3%	+ 6.6%	+30.1%	+30.8%
Central Mgmt. Unit	+20.2	+22.5	+14.6	+22.5	+37.7	+50.1
Western Mgmt. Unit	+ 8.4	+10.4	+ 6.2	+ 4.2	+15.1	+15.1
Total United States	+21.8	+18.9	+ 5.8	+10.6	+28.9	+31.5

In considering changes over the 3-year period, harvest appears to be closely related to changes in hunter numbers, except in the Central Management Unit. The proportionately greater increase in hunters as compared with harvest in this Unit can probably be ascribed, in part, to inclusion of a new hunting State (South Dakota) with a low average season bag (see appendix table A5).

The average season bag of mourning doves is the most reliable statistic available from the waterfowl questionnaire survey. Biases inherent in this survey have less effect on this average than on estimates of hunter and harvest numbers.

The average season bag for each management unit for each of the three hunting seasons is shown below. Nonhunting State data are included in the management unit totals but are not presented separately since they do not relate directly to any hunting area.

Average season bag of mourning doves by adult waterfowl
hunters, 1965-66 through 1967-68

Area	1965-66	1966-67	1967-68
Eastern Mgmt. Unit	27.76	29.47	27.47
Central Mgmt. Unit	28.44	27.90	26.02
Western Mgmt. Unit	20.32	19.94	20.32
Total United States	25.68	26.62	25.40

It can be seen that the increase in dove harvest over the period from 1965-66 to 1967-68 was due to greater numbers of hunters rather than higher success rates.

Although average season bag estimates for States are subject to greater sampling error than those for management units, they are presented in appendix table A5 as a matter of interest to State biologists. Also included are data from Ruos and Tomlinson (1968), 1966 Mourning Dove Status Report, table 6, showing the projected average season bag for the 1965-66 season. The figures derived from the waterfowl questionnaire survey alone are remarkably close to those derived from a combination of this and other sources of information.

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APPENDIX

Table A1.--Changes in population density indexes for breeding mourning doves, 1967-68

EASTERN MANAGEMENT UNIT - HUNTING STATES

State	Comparable routes	Average doves heard/route (weighted) 1/		Percent change 3/
		1967	1968	
Ala.	27	19.26	16.61	-13.7
Del.	1	10.00	7.00	-30.0
Fla.	19	10.99	9.14	-16.9
Ga.	20	18.54	17.08	- 7.9
Ill.	13	29.45	28.44	- 3.4
Ky.	14	31.45	27.51	-12.5
La.	18	9.46	7.92	-16.3*
Md.	7	16.93	14.76	-12.8
Miss.	21	25.57	24.39	- 4.6
N.C.	18	19.24	20.44	+ 6.3
Pa.	14	12.17	9.25	-24.0
R.I. 2/	2	4.50	7.50	+66.7
S.C.	13	31.02	30.04	- 3.2
Tenn.	19	17.87	18.88	+ 5.2
Va.	9	21.17	28.51	+34.7
W. Va.	4	2.96	2.95	- 0.4
Sub-total	219	19.31	18.42	- 4.58

EASTERN MANAGEMENT UNIT - NONHUNTING STATES

State	Comparable routes	1967	1968	Percent change
Conn.	2	5.50	6.00	+ 9.1
Ind.	9	33.08	35.77	+ 8.1
Me. 2/	2	0.00	1.00	+ ∞
Mass.	3	14.46	4.91	-66.1**
Mich.	16	9.73	7.46	-23.3**
N.H. 2/	4	4.00	3.50	-12.5
N.J.	3	15.60	23.29	+49.3
N.Y.	9	8.52	7.43	-12.8
Ohio	10	26.42	27.98	+ 5.9
Vt. 2/	2	5.00	3.50	-30.0
Wisc.	16	12.93	10.87	-15.9
Sub-total	76	16.59	15.99	- 3.64
Eastern Unit Total	295	18.49	17.69	- 4.32

Table A1.--Changes in population density indexes for breeding mourning doves, 1967-68
(continued)

CENTRAL MANAGEMENT UNIT - HUNTING STATES

State	Comparable routes	Average doves heard/route (weighted) 1/		Percent change 3/
		1967	1968	
Ark.	11	24.27	23.45	- 3.4
Colo.	6	13.58	11.60	-14.6
Kans.	16	56.99	55.95	- 1.8
Mo.	11	34.23	36.59	+ 6.9
N.Mex.	10	3.86	7.27	+88.3
Okla.	6	41.34	45.06	+ 9.0
Tex.	27	15.64	14.75	- 5.7
Sub-total	87	22.81	23.18	+ 1.65

CENTRAL MANAGEMENT UNIT - NONHUNTING STATES

State	Comparable routes	1967	1968	Percent change
Iowa	13	41.21	37.03	-10.1
Minn.	7	14.34	16.40	+14.3*
Mont.	6	25.44	7.71	-69.7
Nebr.	17	40.69	48.68	+19.6**
N. Dak.	22	21.40	25.00	+16.8
S. Dak. 4/	11	42.76	49.88	+16.6
Wyo.	6	13.76	9.82	-28.6***
Sub-total	82	27.22	25.48	- 6.38
Central Unit Total	169	24.71	24.18	- 2.17

WESTERN MANAGEMENT UNIT - HUNTING STATES

State	Comparable routes	1967	1968	Percent change
Ariz.	31	28.24	24.39	-13.6
Calif.	51	12.84	10.81	-15.8
Idaho	9	8.51	8.58	+ 0.9
Nev.	12	4.17	7.75	+86.0
Oreg.	20	11.84	12.07	+ 2.0
Utah	11	27.95	15.42	-44.8***
Wash.	21	10.13	9.32	- 8.1
Western Unit Total	155	14.94	12.95	-13.36**

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Table A1.--Changes in population density indexes for breeding mourning doves, 1967-68
(continued)

United States	Comparable routes	Average doves heard/route (weighted) 1/		Percent change 3/
		1967	1968	
Hunting States	461	19.10	18.30	- 4.20
Nonhunting States	158	23.85	22.47	- 5.77
United States Total	619	20.47	19.50	- 4.73

1/ Except as noted, State and management unit indexes were obtained from comparable, randomized route data adjusted for variation in the land area of each physiographic region represented.

2/ State indexes obtained from comparable, non-randomized route data not weighted by physiographic region. State data not represented in the respective management unit means.

3/ Probability that observed change represents actual change:
*90 percent - **95 percent - ***99 percent.

4/ South Dakota--hunting State in 1967.

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Table A2.--Trends in mourning dove breeding density indexes by State, 1958-1968

State	Weight factor 1/	ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE 2/ 3/											10-yr. (1958-67) Data	
		1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	Mean	Departure:1968
EASTERN MANAGEMENT UNIT - HUNTING STATES														
Alabama	33.32	23.1	18.1	22.0	19.4	18.9	16.3	21.1	20.5	20.5	19.8	17.1	20.0	-14.5%
Delaware	1.29	3.8	6.8	6.2	4.6	5.6	5.1	4.4	5.1	3.8	7.5	5.2	5.3	- 0.6
Florida	35.82	8.6	8.6	10.1	9.4	11.4	9.8	11.2	10.5	9.4	9.1	7.6	9.8	-22.8
Georgia	37.82	11.2	13.3	16.9	14.4	16.8	14.4	22.5	18.5	13.1	15.4	14.2	15.7	- 9.4
Illinois	35.09	29.4	29.8	28.3	32.3	26.3	26.9	24.3	23.5	27.0	27.9	27.0	27.6	- 2.2
Kentucky	26.08	29.2	28.8	29.8	28.2	28.6	27.0	30.4	32.5	35.3	29.9	26.2	30.0	-12.7
Louisiana	31.14	20.7	17.9	19.3	17.8	14.2	16.6	13.6	11.6	7.7	8.9	7.4	14.8	-49.8
Maryland	6.55	15.5	18.0	15.6	14.4	15.8	16.1	16.1	16.0	15.2	20.1	17.5	16.3	+ 7.6
Mississippi	30.63	46.3	37.7	37.8	33.2	35.4	30.5	35.1	36.8	33.6	27.7	26.4	35.4	-25.4
North Carolina	22.51	16.5	20.3	19.7	17.3	19.0	21.0	21.9	24.8	26.4	21.4	22.7	20.8	+ 9.2
Pennsylvania	29.01	9.8	10.7	9.5	9.9	8.2	5.6	7.2	7.4	8.7	11.9	9.0	8.9	+ 1.7
Rhode Island 4/	---		7.0	4.0	5.0	5.5	5.5	8.9	5.9	4.2	5.3	8.8	5.7	+55.5
South Carolina	19.99	25.5	24.4	25.8	25.5	23.0	23.0	24.1	35.3	34.4	34.2	33.1	27.5	+20.4
Tennessee	27.07	41.8	35.1	35.6	30.2	34.8	29.2	28.1	30.4	30.4	22.3	23.5	31.8	-26.2
Virginia	26.05	28.8	30.6	30.6	28.7	24.8	25.2	29.0	24.0	29.1	23.6	31.8	27.4	+15.8
West Virginia	15.41	6.2	7.7	20.1	21.0	44.0	18.5	23.4	22.6	9.8	5.0	5.0	17.8	-72.1
SUB-TOT./AVERAGE	377.78	22.8	21.6	23.0	21.5	22.2	19.8	21.9	22.0	21.2	19.6	18.9	21.6	-12.3%
EASTERN MANAGEMENT UNIT - NONHUNTING STATES														
Connecticut	3.23	4.7	4.1	6.5	3.5	3.5	3.0	2.4	1.9	2.9	4.5	4.9	3.7	+33.0%
Indiana 4/	23.36	31.9	33.2	25.1	28.3	23.4	26.8	27.7	20.2	37.2	38.6	41.7	29.2	+42.7
Maine 4/	---		1.5	3.0	3.0	3.0	1.3	0.0	0.3	1.3	0.0	1.0	1.5	-33.3
Massachusetts	5.31	5.2	7.4	10.6	6.9	9.0	5.2	6.7	7.7	11.0	14.5	4.9	8.4	-41.6
Michigan	37.18	12.8	15.5	14.0	14.8	11.8	17.4	13.2	8.0	12.3	11.9	9.1	13.2	-30.7
New Hampshire 4/	---		4.3	6.8	4.6	3.4	3.1	6.3	10.6	7.5	5.0	4.4	5.7	-23.5
New Jersey	4.91	28.0	32.7	32.7	29.0	28.8	29.5	30.4	25.7	24.2	20.1	30.0	28.1	+ 6.8
New York	30.49	7.7	5.8	8.8	7.2	8.3	7.8	7.0	7.1	7.9	7.8	6.8	7.6	- 9.9
Ohio	26.42	20.2	16.9	14.8	17.9	21.4	17.5	16.8	19.1	26.3	25.5	27.0	19.6	+37.5
Vermont 4/	---		1.0	8.0	0.0	2.0	2.0	2.0	1.0	6.0	5.0	3.5	3.0	+16.7
Wisconsin	36.07	17.4	16.1	18.3	18.1	12.7	14.1	15.2	16.1	11.1	13.5	11.4	15.3	-25.6
SUB-TOT./AVERAGE	166.97	16.8	16.6	16.0	16.4	14.7	16.0	15.2	13.4	17.1	17.6	17.0	16.0	+ 6.1%
EAST. MGMT. UNIT TOTAL/AVERAGE	544.75	20.9	20.1	20.8	20.0	19.9	18.6	19.8	19.4	20.0	19.0	18.3	19.8	- 7.7%

Table A2.--Trends in mourning dove breeding density indexes by State, 1958-1968 (continued)

State	Weight factor [1]	ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE [2] [3]											10-yr. (1958-67) Data	
		1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	Mean	Departure:1968
CENTRAL MANAGEMENT UNIT - HUNTING STATES														
Arkansas	34.37	20.9	18.6	17.4	19.0	10.5	16.0	16.8	14.8	16.5	20.7	20.0	17.1	+16.9%
Colorado	67.18	38.2	19.6	28.8	13.8	13.8	11.0	13.1	11.5	14.8	16.1	13.7	18.1	-23.9
Kansas	52.43	37.8	44.2	54.4	55.2	56.2	49.8	53.1	48.2	51.8	60.3	59.2	50.1	+18.2
Missouri	45.10	53.6	47.1	50.2	45.2	42.7	36.7	40.2	36.0	39.3	36.6	39.1	42.8	- 8.5
New Mexico	77.98	14.3	18.7	32.5	21.8	19.2	18.1	20.6	19.3	28.4	8.5	16.0	20.1	-20.5
Oklahoma	44.40	50.6	50.0	40.9	41.6	36.4	39.9	37.7	34.6	29.3	37.9	41.3	39.9	+ 3.6
Texas	170.03	22.5	21.8	22.9	18.6	19.4	17.7	17.4	16.4	17.8	16.8	15.8	19.2	-17.3
SUB-TOT./AVERAGE	491.49	30.2	28.0	32.3	26.9	25.6	23.9	25.0	22.9	25.6	24.0	24.9	26.5	- 5.8%
CENTRAL MANAGEMENT UNIT - NONHUNTING STATES														
Iowa	36.15	23.5	38.3	30.6	38.3	37.1	33.5	34.9	29.0	33.2	34.1	30.7	33.3	- 7.8%
Minnesota	54.09	18.5	15.4	15.0	19.3	15.9	16.2	20.5	18.6	18.7	16.7	19.1	17.5	+ 9.2
Montana	94.47	9.0	9.2	18.3	15.7	10.4	15.1	15.4	15.7	17.1	18.7	5.7	14.5	-60.8
Nebraska	49.69	46.9	98.0	109.3	88.6	69.9	58.7	66.1	55.6	48.5	40.0	47.8	68.2	-29.8
North Dakota	45.54	18.4	20.0	21.2	22.3	20.1	20.0	20.2	23.4	20.7	20.7	24.2	20.7	+16.9
South Dakota [5]	49.20	70.6	64.2	40.2	48.5	37.4	40.6	39.0	35.1	45.3	28.2	32.9	44.9	-26.8
Wyoming	62.33	9.5	11.0	10.0	11.8	10.8	12.7	9.8	12.1	15.9	13.0	9.3	11.7	-20.4
SUB-TOT./AVERAGE	391.47	25.4	32.5	32.3	31.8	25.8	25.9	27.0	25.2	26.6	23.1	21.3	27.5	-22.5%
CENT. MGMT. UNIT TOTAL/AVERAGE	882.96	28.1	30.0	32.3	29.1	25.7	24.8	25.9	23.9	26.1	23.6	23.3	26.9	-13.4%

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Table A2.--Trends in mourning dove breeding density indexes by State, 1958-1968 (continued)

| State | Weight factor [1] | ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE [2] [3] | | | | | | | | | | | 10-yr. (1958-67) Data | |
		1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	Mean	Departure:1968
WESTERN MANAGEMENT UNIT														
Arizona	72.65	22.6	24.4	19.1	34.3	23.8	22.7	27.6	26.6	30.4	27.6	23.8	25.9	- 8.0%
California	101.71	25.0	33.5	36.2	26.0	29.2	29.2	32.0	21.6	17.3	14.2	12.0	26.4	-54.7
Idaho	54.37	15.8	17.7	20.4	18.0	18.3	18.3	20.6	19.4	18.6	17.8	18.0	18.5	- 2.8
Nevada	71.27	1.4	2.6	1.9	2.3	1.2	1.8	2.9	2.7	4.0	4.4	8.2	2.5	+226.0
Oregon	62.27	14.3	20.9	19.2	21.2	18.2	16.8	18.1	14.1	14.0	12.9	13.2	17.0	-22.5
Utah	53.34	15.0	22.9	18.6	14.8	13.6	13.4	12.9	13.7	14.8	22.2	12.3	16.2	-24.3
Washington	43.87	12.6	15.2	10.5	9.2	11.0	9.8	13.2	13.1	13.3	11.4	10.5	11.9	-12.1
WESTERN MGMT. UNIT TOTAL/AVERAGE	459.48	16.1	20.7	19.5	19.1	17.7	17.3	19.5	16.4	16.3	15.7	14.0	17.9	-21.5%
TOTAL HUNT. STATES	1,328.75	23.2	23.7	25.2	22.7	21.9	20.4	22.2	20.4	21.2	19.9	19.4	22.1	-12.0%
TOTAL NONHUNT STATES	558.44	22.8	27.7	27.4	27.2	22.5	22.9	23.5	21.7	23.7	21.4	20.0	24.1	-16.8%
U.S. TOT./ AVERAGE	1,887.19	23.1	24.9	25.9	24.0	22.0	21.2	22.6	20.8	21.9	20.3	19.6	22.7	-13.5%

1/ Assigned State land-area-value

2/ From a base year, average doves heard calling per route for each State has been adjusted annually according to the percent change from the preceding year in counts on comparable routes. Except as noted, percent changes between years have been based upon unweighted, randomized data for the period 1958 to 1965 inclusive. Annual percent changes since 1966 have been derived from randomized data weighted by physiographic regions within States. Base year index (mean of 1966 and 1967) is changed from previous reports.

3/ Percent departures calculated from data carried to three decimal places; hence, apparent rounding errors. Unit and subunit averages calculated by weighting individual State indexes; hence, change in unit long-term trend index may not indicate precisely the same percent change as the 2-year comparison (table A1).

4/ Indexes for Maine, New Hampshire, Rhode Island, and Vermont represent unweighted and unrandomized data and have not been included in the "weighted means."

5/ South Dakota--hunting State in 1967.

Table A3.--Linear regression analysis of mourning dove call-count data, 1958-1968

Management unit	Regression Values (BDI)		Change: 1958, 1968		Mean Annual Change 1958-1968		Significance (Probability that a trend exists)
	1958	1968	Number	Percent	Number	Percent	
Eastern							
Hunt States	22.77	19.85	-2.92	-12.8	-0.29	-1.4	p .95
Nonhunt States	15.98	16.18	+0.20	+ 1.3	+0.02	+0.1	*
Total	20.67	18.75	-1.92	- 9.3	-0.19	-1.0	p .95
Central							
Hunt States	29.55	23.08	-6.47	-21.9	-0.65	-2.4	p .95
Nonhunt States	30.95	23.03	-7.92	-25.6	-0.79	-2.9	p .99
Total	30.18	23.05	-7.13	-23.6	-0.71	-2.7	p .95
Western							
Total	19.51	15.53	-3.98	-20.4	-0.40	-2.3	p .99
United States							
Hunt States	24.15	19.54	-4.61	-19.1	-0.46	-2.1	p .95
Nonhunt States	26.45	20.97	-5.48	-20.7	-0.55	-2.3	p .99
Total	24.82	19.98	-4.84	-19.52	-0.48	-2.1	p .95

*Not significant (p<.95)

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Table A4.--Ranking of 1968 breeding population data by physiographic region within management unit

Rank	United States[1]				Eastern Unit[1]				Central Unit				Western Unit			
	Reg.	1968 BDI[2]	Cum. % of Unit Area	Pop.[3]	Reg.	1968 BDI[2]	Cum. % of Unit Area	Pop.[3]	Reg.	1968 BDI[2]	Cum. % of Unit Area	Pop.[3]	Reg.	1968 BDI[2]	Cum. % of Unit Area	Pop.[3]
1	135	66.9	1.4	4.7	032	47.1	3.1	8.3	135	66.9	3.0	8.2	205	33.0	1.5	3.7
2	130	49.5	2.2	6.8	111	37.5	8.0	18.6	130	49.5	4.8	11.9	222	31.0	9.5	22.9
3	032	47.1	3.1	9.0	042	36.1	8.3	19.2	125	46.9	12.2	26.3	180	28.0	10.0	24.1
4	125	46.9	6.5	17.1	124	34.3	18.9	39.9	126	39.5	21.1	40.9	246	20.6	14.7	31.5
5	126	39.5	10.6	25.4	035	30.1	21.2	43.8	122	38.6	29.2	53.9	231	18.0	16.6	34.2
6	122	38.6	14.3	32.8	031	22.8	24.1	47.5	035	29.0	31.3	56.4	203	17.3	18.5	36.7
7	111	37.5	15.8	35.6	041	21.1	31.0	55.7	141	28.4	34.6	60.2	215	17.0	21.8	41.0
8	042	36.1	15.9	35.7	123	18.7	33.2	58.0	216	26.0	35.5	61.2	204	15.7	24.2	43.9
9	124	34.3	19.1	41.4	034	17.1	46.8	71.2	134	25.6	45.7	72.0	224	14.3	29.9	50.3
10	205	33.0	19.4	42.0	112	16.8	48.0	72.3	132	23.5	55.9	81.9	214	12.8	32.8	53.1
11	222	31.0	21.4	45.1	113	14.5	48.4	72.6	151	21.0	56.2	82.2	223	12.7	33.7	54.0
12	035	29.5	23.0	47.6	062	14.2	51.4	75.1	131	20.9	58.3	84.0	221	11.3	60.2	77.2
13	141	28.4	24.5	49.8	121	13.8	60.3	82.0	136	19.7	60.3	85.6	234	11.1	64.1	80.1
14	134	25.6	29.1	55.8	061	12.8	63.5	84.4	036	17.0	70.0	92.5	212	11.0	65.5	81.7
15	132	23.5	33.8	61.5	037	12.5	69.7	88.7	138	13.6	72.5	93.9	201	10.0	71.9	86.7

[1] Excludes Maine, New Hampshire, Rhode Island, and Vermont.

[2] Mean doves heard calling per route.

[3] Regional Breeding Population Index ÷ Unit Breeding Population Index.

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Table A5.--Average season bag of mourning doves by adult waterfowl hunters

Area	SSR[1] 1965-66	Waterfowl Questionnaire 1965-66	1966-67	1967-68
EASTERN MGMT. UNIT				
Alabama	41.7	41.36	43.48	37.10
Delaware	12.1	12.21	14.63	11.57
Florida	28.0	29.08	29.98	31.11
Georgia	35.2	35.20	37.90	40.39
Illinois	15.5	15.19	22.29	22.54
Kentucky	41.0	40.16	50.18	41.18
Louisiana	27.3	26.87	28.78	29.48
Maryland	14.8	14.81	19.62	15.16
Mississippi	43.8	42.78	41.36	39.90
North Carolina	33.6	32.44	35.18	35.06
Pennsylvania	11.3	11.20	14.38	10.83
Rhode Island	12.5	12.10	12.59	14.92
South Carolina	45.2	44.69	43.05	33.48
Tennessee	34.4	33.17	33.07	37.15
Virginia	28.3	27.90	27.62	25.47
West Virginia	11.8	10.00	12.47	10.52
Subtotal	29.2	27.76	29.76	27.84
CENTRAL MGMT. UNIT				
Arkansas	24.9	25.33	24.57	27.41
Colorado	13.9	13.74	16.03	15.37
Kansas	19.3	19.80	23.04	20.38
Missouri	19.7	19.67	24.44	20.39
New Mexico	32.8	32.72	31.42	31.97
Oklahoma	28.9	29.23	30.00	29.48
Texas	36.8	36.60	40.51	36.13
South Dakota	–	–	–	12.44
Subtotal	28.0	28.44	27.90	26.02
WESTERN MGMT. UNIT				
Arizona	38.0	37.75	40.88	37.82
California	24.1	23.60	22.62	23.59
Idaho	12.0	12.77	14.19	15.16
Nevada	19.9	19.84	20.21	20.19
Oregon	12.9	13.14	14.16	14.47
Utah	11.2	11.22	12.83	13.73
Washington	14.1	14.34	14.98	14.80
Subtotal	19.1	20.32	19.94	20.32
GRAND TOTAL	25.0	25.68	26.62	25.40

[1] Data from SSR #115, Mourning Dove Status Report, 1966. Ruos and Tomlinson.

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